

TRUSTAI

TRANSPARENT, RELIABLE
& UNBIASED SMART TOOL

Work Package 8 – Website requirements

LTPlabs



January 25th, 2023



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant agreement No 952060.



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0.1	Fábio Moreira (INESC-TEC)	10/02/2021	Document structure
1.0	LTPlabs	06/04/2021	Final revision
1.1	LTPlabs	25/01/2023	Revision of rejection letter feedback



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Abbreviations and Acronyms

AI	Artificial Intelligence
EC	European Commission
EU	European Union
KPIs	Key Performance Indicators
TRUST	Short for TRUST-AI
WP	Work Package
XAI	Explainable Artificial Intelligence

1. General Requirements

TRUST AI's website presents the project's objectives and expected outcomes. It also serves as an interaction within target groups and as a dissemination platform.

Regular updates on the project progress and activities, reports, leaflets, videos and recommendations will be shared on the website. It also includes most of the other tools used to communicate with the project target audience during the project, such as news feeds, press releases, scientific publications, newsletters or public deliverables. Table 1 provides an in-depth look at the website's high-level requirements. Table 1 - Website's high-level requirements

Table 1 - Website's high-level requirements

Website's high-level requirements	
Goal	<ul style="list-style-type: none"> Disseminate the project's objective and its achievements throughout the various use cases Interact with different target groups, building and ecosystem around Explainable AI, human-guided machine learning and symbolic learning
Consortium	Present the consortium partners and link to their institutional websites
Overall framework	Communicate the overall governing framework, along with the constituent work packages and their interactions
Technical information	Display the technologies and paradigms used, along with discussions on the matter, related articles and other resources that provide technical detail
Case studies	Present each case studies' involved partners, the motivation, a description of the challenge and the approach, and the results achieved
Communication	Provide an archive of all publications, news, articles and other resources directly related to the work built under TRUST-AI



2. Website structure

2.1.1. Homepage

Table 2 – Homepage's requirements

Homepage		
Section	Requirements	Screenshot
Banner	Assert TRUST-AI's image and moto	Figure 1
About	<ul style="list-style-type: none">Clearly communicate the project's goalHigh-level view of the approach and human-algorithm interactionHigh-level project highlights like funding received, partners involved, duration, and work packages	Figure 2
Use cases	Brief overview of the three use cases with clear identification of the business partners involved	Figure 3
Latest news	Keeping up with the latest news, articles and other resources publish about the project	Figure 4
Partners	List all the partners involved in the development of the work packages with link to their institutional websites	Figure 5
Footer	Information about financing, disclaimer, TRUST AI contacts and links for social media	Figure 6

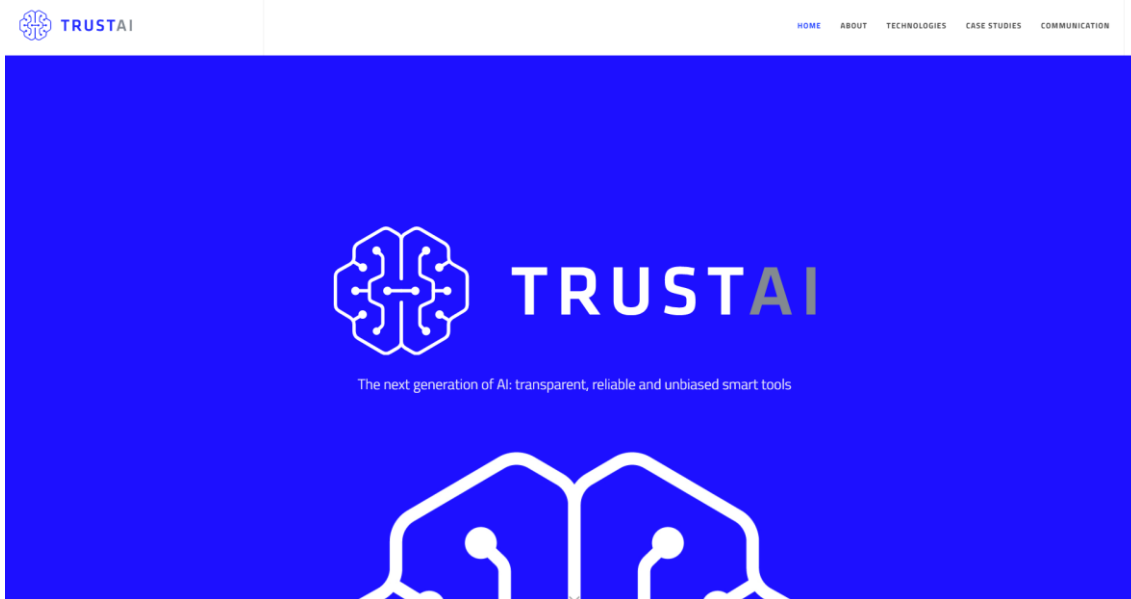


Figure 1 – Homepage banner

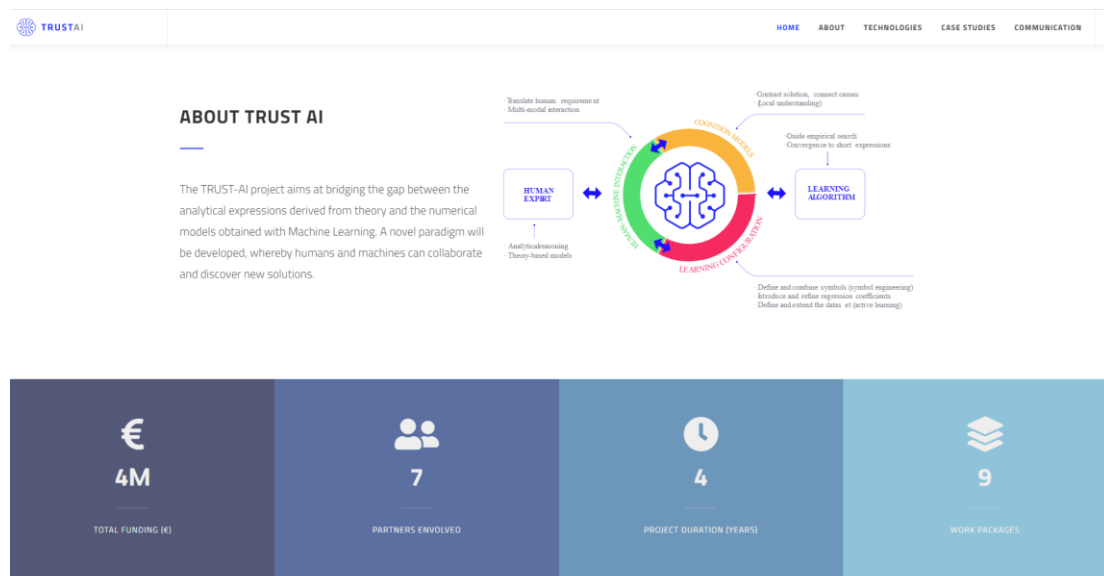


Figure 2 – Homepage page: about section

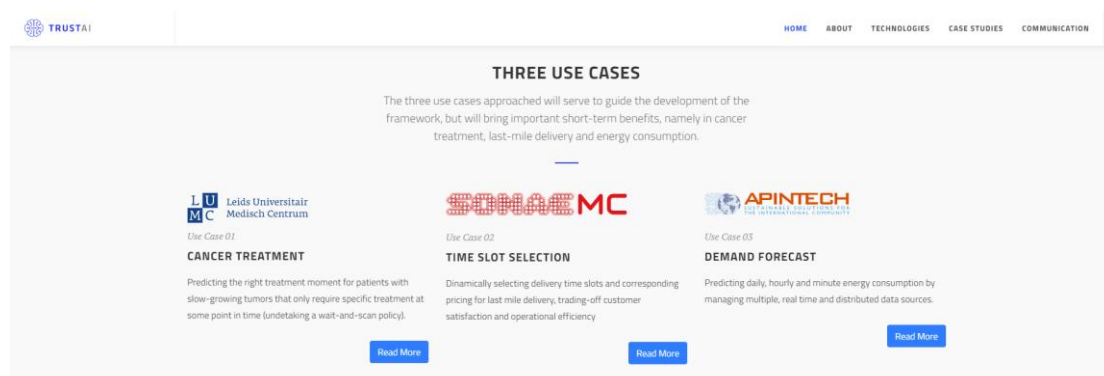


Figure 3 - Homepage: use cases section



LATEST FROM THE PROJECT

Communication & dissemination will ensure excellence and raise public awareness regarding the project. Check here our latest outcomes

Press Release

Feb 10, 2021 | Press Release

We are honoured to announce that in the Framework of Horizon 2020, our TRUST AI Project: 952060, Call: H2020-EIC-FETPROACT-2019 has been started as of October 2020. The H2020-RIA (Research and Innovation Action) project will last for 48 months and has a €4M budget.

[Read More](#)

TRUST-AI, the next generation of artificial intelligence will be explainable and collaborative

Dec 21, 2020 | News
Original published by: [in-cyprus](#)

Artificial Intelligence (AI) is a game-changer for a variety of sectors. AI's boost to the global economy by 2030 is forecasted to be of \$15.7 trillion (source PwC), and by 2021 80% of emerging technologies will have AI foundations (source Gartner).

[Read More](#)

News

Oct 28, 2020 | News
Original published by: [cirs](#)

L'intelligence artificielle et en particulier l'apprentissage profond produisent des résultats toujours plus impressionnants, mais selon des processus souvent inaccessibles au raisonnement humain.

[Read More](#)

El proyecto que utiliza la teoría de la evolución de Darwin para explicar la Inteligencia Artificial

Sep 26, 2020 | News
Original published by: [EL PAÍS](#)

La Inteligencia Artificial (AI) está por todas partes. Gracias a todo este mecanismo oculto, una máquina es capaz de aprender hasta 1.000 millones de parámetros y usarlos luego para dar la respuesta acertada en cuestión de segundos.

[Read More](#)

Figure 4 - Homepage: latest news section

MEET THE PARTNERS

Communication & dissemination will ensure excellence and raise public awareness regarding the project. Check here our latest outcomes



Figure 5 - Homepage: partners section

info@trustai.eu

SITEMAP

- > Home
- > About
- > Technologies
- > Case Studies
- > Communication

FINANCING

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant agreement No 952060

DISCLAIMER

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Figure 6 - Homepage: footer



2.1.2. About Page

Table 3 – Page “About” requirements

About		
Section	Requirements	Screenshot
Project overview	Answer the main project’s questions, such as: “Why?”, “What?” and “How?”	Figure 7
An introduction to TRUST AI	Place a video about interpretable AI, produced to be presented at Future Tech Week 2020	Figure 8
TRUST AI System	Explanation about the proposed solution - TRUST AI system, both with text and infographics	Figure 9
Work Packages	Structure and strategic target of the project’s work packages	Figure 10
Partners	List all the partners involved in the development of the work packages (similar to Homepage)	Figure 5
Footer	Information about financing, disclaimer, TRUST AI contacts and links for social media (similar to Homepage)	Figure 6

ABOUT

WHY?

AI is gaining importance in several areas, but the existing methods are virtually impossible to interpret and hence trust

WHAT?

Build a method that is as effective as AI black-boxes and as explainable as theory-based approaches

HOW?

By putting machine learning working with analytical expressions, based on numerical (but representative) datasets, and iterate with human experts

Figure 7 - About: Project overview

AN INTRODUCTION TO TRUST AI

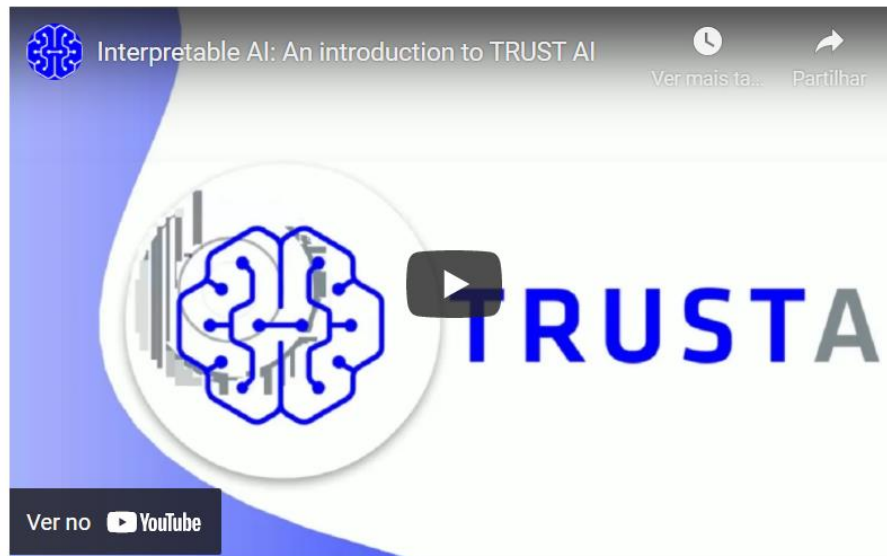
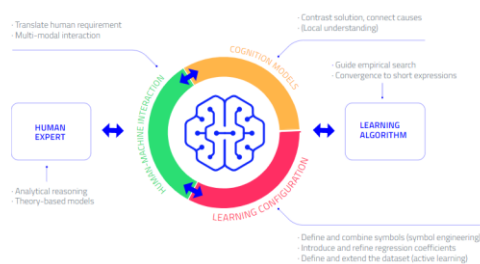


Figure 8 - About: Video



TRUST AI SYSTEM

TRUST AI aims at working towards the next generation of Machine Learning with improved performance-explainability trade-off. The resulting tool is TRUST (Transparent, Reliable and Unbiased Smart Tool) that will use symbolic learning methods to work with expressions rather than constants. That way, not only the human can understand the AI models better, but also the promoted interaction will accelerate the convergence of human and machine. This iterative process will be facilitated by different components, developed by an interdisciplinary consortium, and which communicate in the integrated framework from the Figure.

By being fundamentally explainable, TRUST is transparent, reliable, and able to prevent undesirable biases. Therefore, we envision TRUST being used in practice in a vast amount of applications and disrupting multiple sectors, where human control is essential. This project will tackle three case studies: (link to case studies): Cancer Treatment (Health), Time Slot Selection (Retail), Demand Forecast (Energy).

Figure 9 – About: TRUST AI System

WORK PACKAGES

TRUST is composed of 9 work packages (WP) which will be developed in a 48-month work plan. The work packages are structured around the following strategic targets:

- **Development of building blocks:** WP2 to WP4 develop the R&D areas and establish the foundations of the human-guided symbolic learning paradigm. WP1 concerns the overall design of this paradigm, as well as the consolidation and workflow of the building blocks.
- **Adequacy to real applications:** WP5 to WP7 are devoted to the use cases applications. They define requirements and ensure that TRUST apply to various problems and industries.
- **Communication and dissemination:** WP8 extends the project impact by promoting the results to the scientific community and industry. It also concerns the debate on societal and ethical issues.
- **Project Management:** WP9 refers to the project management and coordination of the partners.

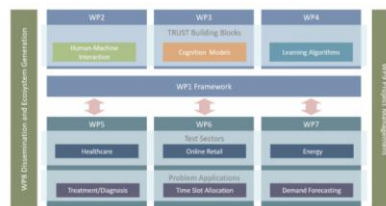


Figure 10 – About: Work Packages

2.1.3. Technologies Page

Table 4 – Page “Technologies” requirements

Technologies		
Section	Requirements	Screenshot
Explainable AI (XAI)	<ul style="list-style-type: none"> • Explanation about the technology side by side with an illustrative image • Button with a call-to-action to check papers related to the technology 	Figure 11
Genetic Programming / Symbolic Learning	<ul style="list-style-type: none"> • Explanation about the technology side by side with an illustrative image • Button with a call-to-action to check papers related to the technology 	Figure 12
Human-guided AI	<ul style="list-style-type: none"> • Explanation about the technology side by side with an illustrative image • Button with a call-to-action to check papers related to the technology 	Figure 13
Other relevant technologies	This webpage could be updated with additional sections regarding technologies not included in this initial requirements’ gathering	-
Footer	Information about financing, disclaimer, TRUST AI contacts and links for social media (similar to Homepage)	Figure 6



EXPLAINABLE AI (XAI)

Making AI technology more trustworthy and transparent depends on our ability to explain why an AI system took a certain decision. The goal of XAI is to allow humans to ask and receive explanations from AI systems that are comprehensible by humans. To reach this goal TrustAI focus on two core concepts: genetic programs and human causal explanations. Genetic programs are AI algorithms that learn from data but output symbolic expressions that can be inspected by humans. Human explanations have been reported to highlight specific cause-effect relations and take into account the knowledge of the person receiving the explanation. TrustAI is combining these two fields together with feedback from human evaluators to produce human interpretable explanations of automated decision systems. In particular, TrustAI technology will be applied to provide explanations for AI solutions in the fields of medical oncology, energy forecast, and retail logistics.

[Check References →](#)

Figure 11 – Technologies: Explainable AI (illustrative)

GENETIC PROGRAMMING

Historical GP and most current GP works handles functions or programs using parse trees to represent them. Trees are built from operators (trees' nodes) and operands (terminals or trees' leaves) chosen according to a domain problem. For classification problems, the goal is to find a function that outputs the correct labels of available data; For regression problems, the goal is to discover a mathematical expression that minimizes an error metric, a problem known as symbolic regression. In such a context, nodes are standard arithmetic operations and mathematical functions (e.g., sin, cos), and terminals are the problem variables and some ephemeral constants. Figure 2 illustrates a tree representation of the program $\cos(2x)+4x$. In GP, the general fitness measure checks how well each program performs in a particular domain. The Mean Square Error (MSE) between the tree output and the desired value for all examples in the training set (aka fitness cases) is the basic fitness function for symbolic regression. In order to avoid the uncontrolled growth of the tree size along evolution (aka bloat), the fitness function may combine MSE with parsimony such as size of the tree, or efficiency (e.g., computing budget). From a ML viewpoint, GP requires none or minor feature engineering. Likewise, it uses programs as representations to not require any prior knowledge, and it gets to a solution by evolving candidates in the chosen search space.

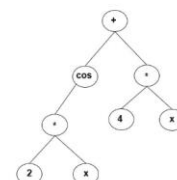


Figure 2. Tree representation for the program $\cos(2x)+4x$

[Check References →](#)

Figure 12 – Technologies: Genetic Programming / Symbolic Learning (illustrative)



HUMAN-GUIDED AI

Although Artificial Intelligence technologies have a computational capacity far beyond humankind, intervention can sometimes be necessary. Without a human to guide the machine intelligence, the decisions it will make can not be fully reliable. The first step of guiding AI is to train it with well prepared data. An ideal set of data should be compatible with the problem being solved, the particular goals of the business person and regulations. The decision on whether the data is suitable is made by humans. After using that data for training, the validation process shows how well the decisions can be made. At this point, if the hyperparameter tuning can not be automated, meaning that there are multiple criteria that need to be optimized, then human intervention and help is a must.

The concept of Human-Guided AI includes humans in the process and this helps machines to be trained more in agreement with the expectations of human experts in terms of factors such as ethics or bias or stability of the models. This collaboration is one of the key elements for building trust between humans and machines. Under changing real life scenarios, data keep changing and so do the models. For those cases, speed and efficiency of data and model validation become key factors that determine whether the machine learning model. TrustAI carries this mission of trust while building a set of solutions about Prognosis and Treatment Prediction for a very Rare Paraganglioma Cancer, Retail Willingness to Pay for Delivery at certain time intervals and Energy Forecast.

[Check References →](#)

Figure 13 – Technologies: Human-guided AI (illustrative)



2.1.4. Case Studies Page

Table 5 – Page “Case Studies” requirements

Case Studies		
Section	Requirements	Screenshot
Cancer Treatment (Healthcare)	<ul style="list-style-type: none">• Illustrative image with the title of the use case• When hover the image, shows a button that follows to a detailed page about this use case	Figure 14
Time Slot Selection (Retail)	<ul style="list-style-type: none">• Illustrative image with the title of the use case• When hover the image, shows a button that follows to a detailed page about this use case	Figure 15
Demand Forecast (Energy)	<ul style="list-style-type: none">• Illustrative image with the title of the use case• When hover the image, shows a button that follows to a detailed page about this use case	Figure 16
Footer	Information about financing, disclaimer, TRUST AI contacts and links for social media (similar to Homepage)	Figure 6

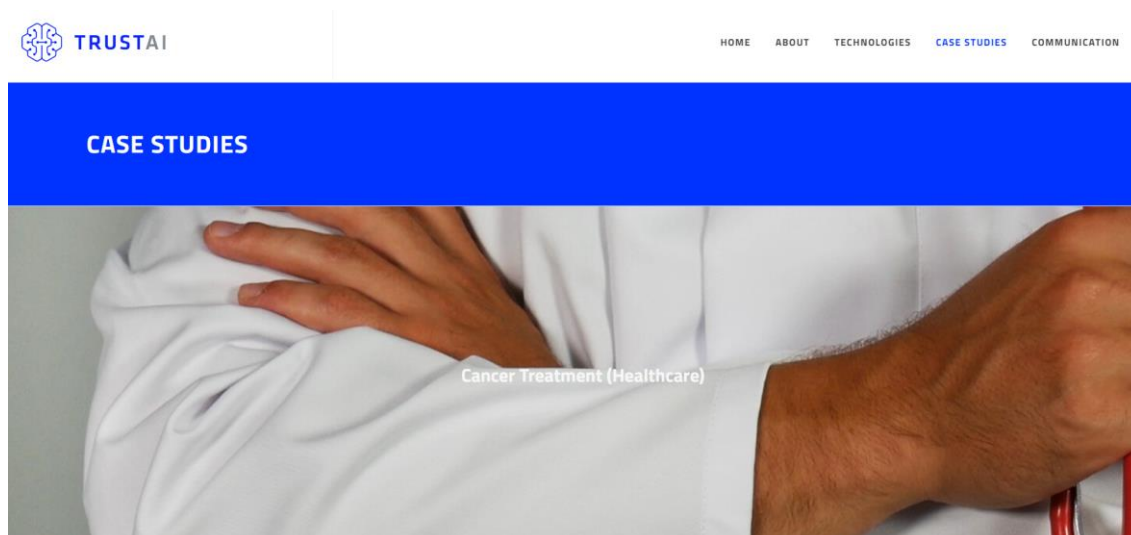


Figure 14 – Case Studies: Cancer Treatment (Healthcare)

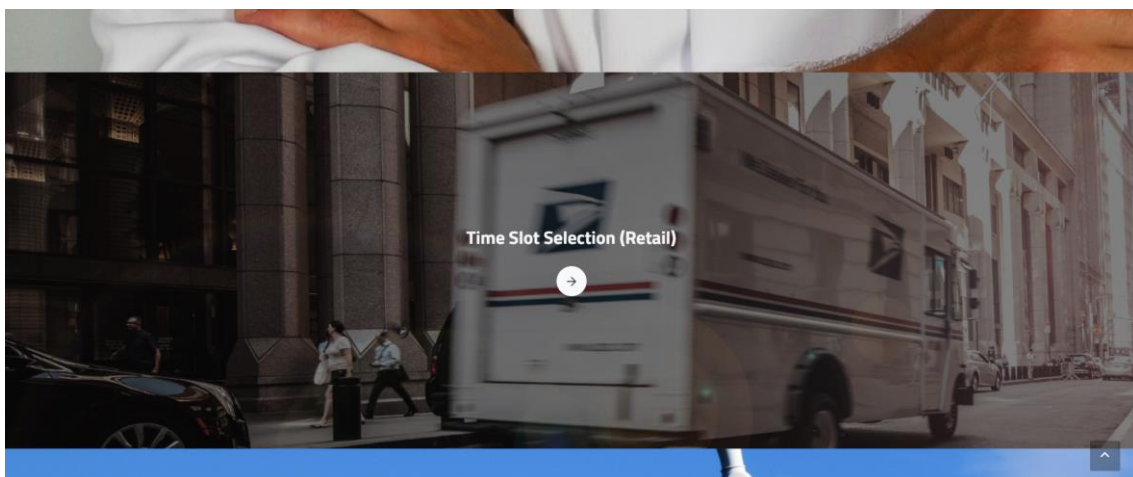


Figure 15 – Case Studies: Time Slot Selection (Retail)

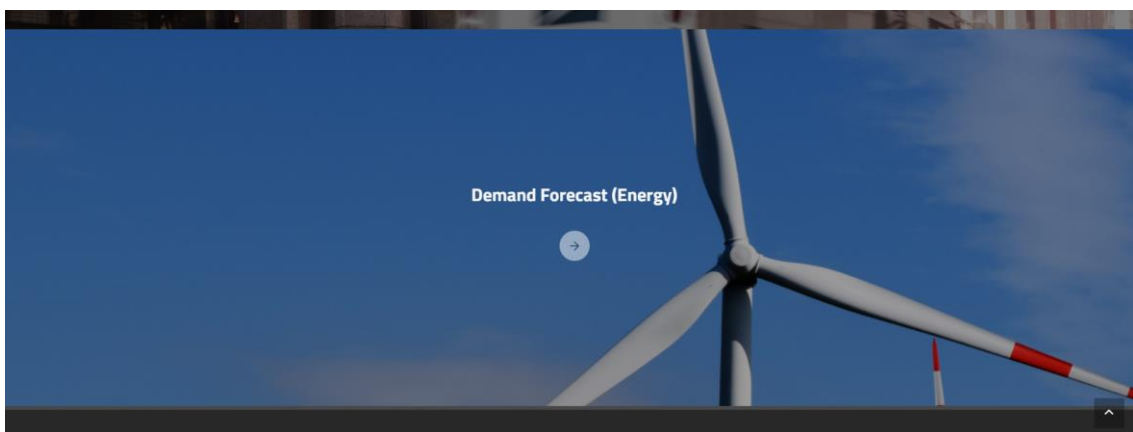


Figure 16 – Case Studies: Demand Forecast (Energy)

2.1.5. Case Studies - Detail Page

Table 6 – Page “Case Studies - Detail” requirements

Case Studies - Detail		
Section	Requirements	Screenshot
Motivation	Explanation about the drivers of the case study, side by side with an illustrative image	Figure 17 Figure 11
Challenge	Definition of the problem and what are the goals/KPIs to improve results, side by side with an illustrative image	Figure 18
Approach	Description of the main methodologies and actions taken, as well as the benefits of the approach, side by side with an illustrative image	Figure 19
Footer	Information about financing, disclaimer, TRUST AI contacts and links for social media (similar to Homepage)	Figure 6

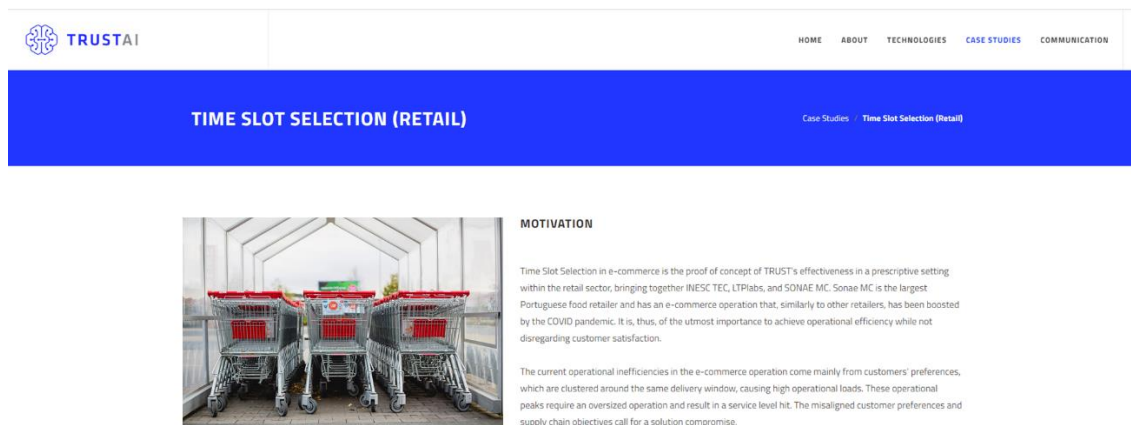


Figure 17 – Use-case for time slot selection: Motivation

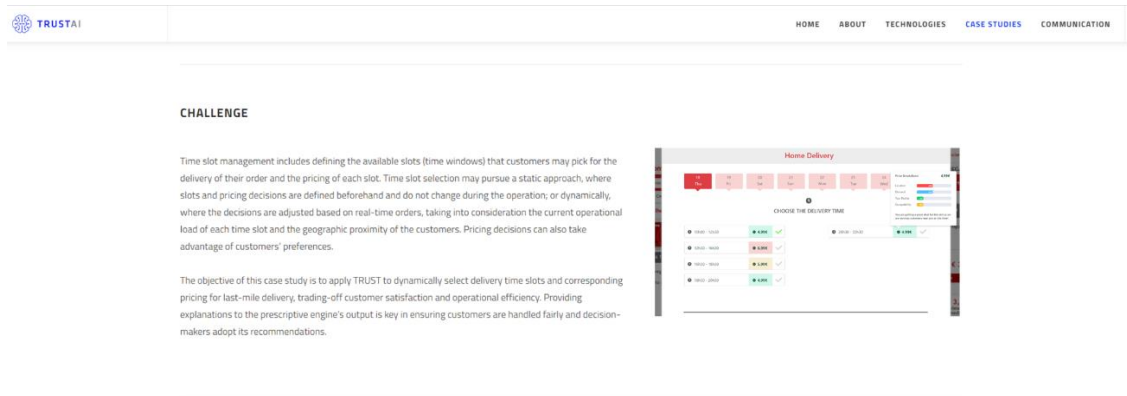


Figure 18 – Use case for time slot selection: Challenge

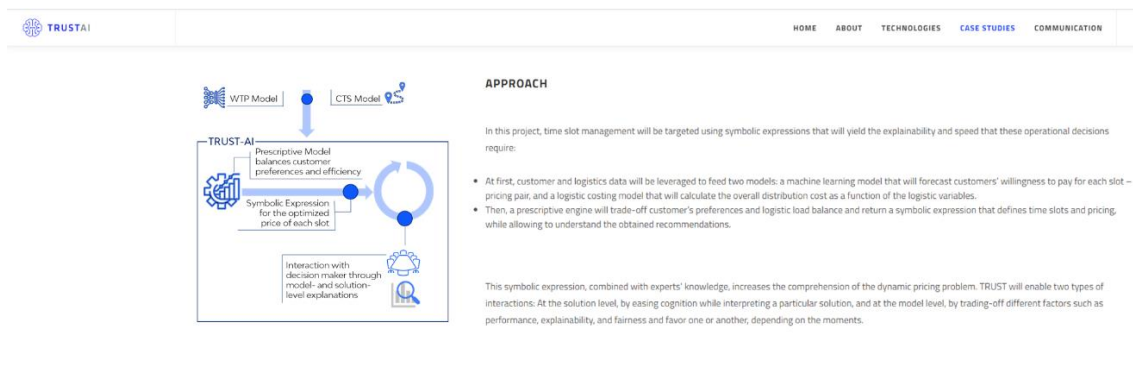


Figure 19 – Use case for time slot selection: Approach

2.1.6. Communication Page

Table 7 – Page “Communication” requirements

Communication		
Section	Requirements	Screenshot
Banner	Button to download the media kit	Figure 20
News & Events	List of the latest news and events, each one with a photo, title, category tag, date, font (when applied), short description and a button that follows to a detail's page	Figure 21
Footer	Information about financing, disclaimer, TRUST AI contacts and links for social media (similar to Homepage)	Figure 6



COMMUNICATION

[Download Media Kit](#)

Figure 20 – Communication: Banner

Press Release

TRUSTAI

News

PRESS RELEASE

Press Release | 10 February 2021

We are honoured to announce that in the Framework of Horizon 2020, our TRUST AI Project: 952060, Call: H2020-EIC-FETPROACT-2019 has been started as of October 2020. The H2020-RIA (Research and Innovation Action) project will last for 48 months and has a €4M budget.

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TRUST-AI, THE NEXT GENERATION OF ARTIFICIAL INTELLIGENCE WILL BE EXPLAINABLE AND COLLABORATIVE

News | 21 December 2020

Original published by: [in-cyprus](#)

Artificial Intelligence (AI) is a game-changer for a variety of sectors. AI's boost to the global economy by 2030 is forecasted to be of \$15.7 trillion (source PwC), and by 2021 80% of emerging technologies will have AI foundations (source Gartner).

[Read More](#)

TRUST-AI, UN PROJET POUR UNE INTELLIGENCE ARTIFICIELLE DE CONFIANCE

News | 28 October 2020

Original published by: [cnrs](#)

L'intelligence artificielle et en particulier l'apprentissage profond produisent des résultats toujours plus impressionnants, mais selon des processus souvent inaccessibles au raisonnement humain.

[Read More](#)

EL PROYECTO QUE UTILIZA LA TEORÍA DE LA EVOLUCIÓN DE DARWIN PARA EXPLICAR LA INTELIGENCIA ARTIFICIAL

News | 26 September 2020

Original published by: [EL PAÍS](#)

La Inteligencia Artificial (IA) está por todas partes. Gracias a todo este mecanismo oculto, una máquina es capaz de aprender hasta 1.000 millones de parámetros y usarlos luego para dar la respuesta acertada en cuestión de segundos.

[Read More](#)

Figure 21– Communication: News & Events

2.1.7. Communication – Detail Page

Table 78 – Page “Communication - Detail” requirements

Communication - Detail		
Section	Requirements	Screenshot
News	<ul style="list-style-type: none"> The top of the page must have the news' title, photo, category tag, date, and font (with link to original publication, when applied). The main text should be in “blog style”, with the option of including imagens and hyperlinks. The bottom of the page must have two buttons: one to share the news on social media networks and another to return to Communication main page 	Figure 20 and Figure 23
Footer	Information about financing, disclaimer, TRUST AI contacts and links for social media (similar to Homepage)	Figure 6



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HOME ABOUT TECHNOLOGIES CASE STUDIES COMMUNICATION

El proyecto que utiliza la teoría de la evolución de Darwin para explicar la Inteligencia Artificial

EL PROGRAMA TRUST-IA QUE EMPIEZA EN OCTUBRE RECIBE LA FINANCIACIÓN DE LA COMISIÓN EUROPEA PARA SIMPLIFICAR LOS SISTEMAS DE APRENDIZAJE AUTOMÁTICOS Y HACERLOS MÁS TRANSPARENTES

Sep 26, 2020 Original published by EL PAÍS News

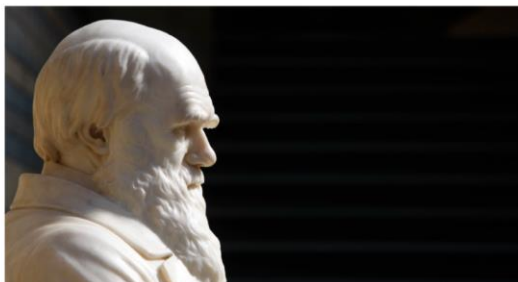


Figure 22 – Communication – Detail: News

Artificial transparente que deje ver qué ocurre en las zonas ocultas de su red y qué camino emprende para dar una sola y única solución.

Richard Benjamins, co-fundador de OdiselA, el Observatorio español para el Impacto Ético y Social de la Inteligencia Artificial, opina que el tema de este nuevo proyecto europeo es muy pertinente debido al creciente uso de la IA en muchos sectores. "La IA explicable tiene especial importancia cuando las decisiones tomadas por los sistemas tienen un impacto significativo en la vida de las personas, como ocurre con en el diagnóstico médico, la inscripción en los servicios públicos, la solicitud de préstamos, entre otras". Cuenta Benjamins que el año pasado, la agencia de defensa de los Estados Unidos (DARPA, por sus siglas en inglés) lanzó un gran proyecto al respecto, por lo que un proyecto europeo es "más que bienvenido". El experto de OdiselA precisa que, sin embargo, no todos los algoritmos de IA son cajas negras, y que ya existen algunas técnicas parecidas para hacer más transparentes los que sí lo son, como el SHAP (SHapley Additive exPlanations) y el LIME (Local Interpretable Model-Agnostic Explanations). "Más allá de ello, este es definitivamente un proyecto importante", concluye.

News

Share 0

Figure 23 – Communication – Detail: Buttons



3. Website specifications

Table 3 - Website's specification

Website's specifications	
Domain	trustai.eu
Temporary URL	http://trust-ai.itplabs.com/
Permanent URL	http://www.trustai.eu/

